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Optics and photonics — Test methods for telescopic systems —

Part 5: Test methods for transmittance

Optique et photonique — Méthodes d'essai pour systèmes télescopiques —

Partie 5: Méthodes d'essai du facteur de transmission

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 172, *Optics and photonics*, Subcommittee SC 4, *Telescopic systems*.

This third edition cancels and replaces the second edition (ISO 14490-5:2017), which has been technically revised.

The main changes compared to the previous edition are as follows:

— updates in Clause 5, in particular 5.7. "Veiling glare stop" was deleted, clarification of requirements on "Integration sphere", addition of 5.9;

— updates in Clause 9, in particular 9.1 and 9.2. The function $V(\lambda)$ for the 2° observer was replaced by the function $V10(\lambda)$ for the 10° observer to be consistent with 9.2, where the function $V'(\lambda)$ for the 10° observer [now called $V'10(\lambda)$] was already used;

— clarification of requirements in Clause 10;

— addition of B.4;

A list of all parts in the ISO 14490 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Optics and photonics — Test methods for telescopic systems —

Part 5: Test methods for transmittance

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1 Scope

This document specifies the test methods for the determination of the transmittance of telescopic systems and telescopic observational instruments.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/CIE 11664-1:2019, *Colorimetry — Part 1: CIE standard colorimetric observers*

ISO 11664-2, *Colorimetry — Part 2: CIE standard illuminants*

ISO 14132-1, *Optics and photonics — Vocabulary for telescopic systems — Part 1: General terms and alphabetical indexes of terms in ISO 14132*

ISO 14490-1:2005, *Optics and optical instruments — Test methods for telescopic systems — Part 1: Test methods for basic characteristics*

CIE 18.2:1983, *Basis of Physical Photometry*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 14132-1 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

4 Principle

To determine the spectral transmittance, $\tau(\lambda)$, the flux of radiation in a limited bundle of rays will be measured before entering $\Phi_0(\lambda)$ and after passing $\Phi_p(\lambda)$ through the optical system.

The spectral transmittance is given by Formula (1):

$$\tau(\lambda)=\frac{\Phi_p(\lambda)}{\Phi_0(\lambda)} \tag{1}$$

During the spectral measurement, the emergent light of the radiation source will be limited to a narrow wavelength band by means of a monochromator or a set of filters.

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